CLAIMS

What is claimed is:

1. A method of detecting artificial illumination in a scene, comprising:

predicting at least one frequency for a variation in the illumination in the scene;

measuring light from the scene at a periodic rate, where the periodic rate is different than any of the predicted frequencies, using an exposure length that is different than any of the periods of the predicted frequencies;

detecting the presence of an artificial illuminant when the measured light from the scene contains periodic changes.

2. The method of claim 1 where the periodic changes are variations in brightness.

3. The method of claim 1 where the light from the scene is focused onto a photo sensor and the periodic changes are variations in contrast.

4. The method of claim 1 where the periodic rate is close to, but not equal to, twice a common AC frequency.

5. The method of claim 4 where the common AC frequency is 60 Hz.

6. The method of claim 4 where the common AC frequency is 50 Hz.

7. The method of claim 1 where the exposure length is much smaller than ½ of any of the periods of the predicted frequencies.

8. The method of claim 7 further comprising:

choosing one of the predicted frequencies;

re-measuring the light from the scene using a periodic rate that is an integer multiple of the chosen frequency;

confirming the actual frequency of the artificial illuminant by comparing the re-measured light for a reduction in the variability of the light intensity.

9. The method of claim 8 further comprising:

re-measuring the light from the scene using a periodic rate that is not an integer multiple of the chosen frequency;

determining the phase of the periodic changes by detecting the positions of the intensity variations.

10. The method of claim 1 further comprising:

determining the phase and frequency of the periodic changes with FFT analysis of the sampled light.

11. The method of claim 1 where the exposure length is larger than ½ of any of the periods of the predicted frequencies.

12. The method of claim 11 further comprising:

choosing one of the predicted frequencies;

re-measuring the light from the scene using an exposure length that is an integer multiple of the chosen frequency;

confirming the actual frequency of the artificial illuminant by comparing the re-measured light for a reduction in the variability of the light intensity.

13. A method of detecting artificial illumination in a scene, comprising:

predicting a frequency for a variation in the illumination in the scene;

measuring light from the scene at a periodic rate using an exposure length that is equal to the period of the predicted frequency;

detecting the presence of an artificial illuminant when the variability of the measured light is high.

14. The method of claim 13, further comprising:

re-measuring light from the scene at a periodic rate using an exposure length that is equal to the period of a second predicted frequency;

detecting the presence of an artificial illuminant when the variability of the re-measured light is high; and

determining that the scene contains only small amounts of artificial illumination when the variability of the re-measured light is low.

15. A method of detecting artificial illumination in a scene, comprising:

predicting a frequency for a variation in the illumination in the scene;

measuring light from the scene at a periodic rate, where the periodic rate is equal to an integer multiple of the predicted frequency, using an exposure time that is different than the period of any of the predicted frequencies;

detecting the presence of an artificial illuminant when the variability of the measured light is high.

16. The method of claim 15, further comprising:

re-measuring light from the scene at a second periodic rate, where the second periodic rate corresponds to a second predicted frequency;

detecting the presence of an artificial illuminant when the variability of the re-measured light is high; and

determining that the scene contains only small amounts of artificial illumination when the variability of the re-measured light is low.

17. An apparatus for detecting artificial illumination in a scene comprising:

a photo sensor array, the photo sensor array configured to measure light from the scene at a periodic frequency using a predetermined exposure time;

a processor, the processor configured to determine the presence of an artificial illuminant by examining the measured light from the scene for periodic intensity variations.

18. The apparatus of claim 17 where the periodic rate is close to, but not equal to, twice a common AC frequency.

19. The method of claim 18 where the common AC frequency is 60 Hz.

20. The method of claim 18 where the common AC frequency is 50 Hz.

21. An apparatus for detecting artificial illumination in a scene comprising:

a photo sensor array, the photo sensor array configured to measure light from the scene at a periodic frequency using a predetermined exposure time;

a lens configured to focus the light from the scene onto the photo sensor array;

a processor, the processor configured to determine the presence of an artificial illuminant by examining the measured light from the scene for periodic contrast variations.

22. The apparatus of claim 21 where the periodic rate is close to, but not equal to, twice a common AC frequency.

23. An apparatus for detecting artificial illumination in a scene comprising:

a means for measuring light from the scene at a periodic frequency using a predetermined exposure time;

a means for determining the presence of an artificial illuminant by examining the measured light from the scene for periodic intensity variations.

24. A digital camera comprising:

a photo sensor array, the photo sensor array configured to measure light from a scene at a periodic frequency using a predetermined exposure length;

a lens configured to focus the light from the scene onto the photo sensor array;

a processor, the processor configured to determine the presence of an artificial illuminant by examining the measured light from the scene for periodic variations.

25. A method of determining the illumination type in a scene, comprising:

predicting at least one frequency for a variation in the illumination in the scene;

measuring light from the scene at a periodic rate, where the periodic rate is different than any of the predicted frequencies, using an exposure length that is different than any of the periods of the predicted frequencies;

comparing the variability of the measured light to a first threshold;

detecting natural illumination when the variability of the measured light is below the first threshold;

detecting artificial illumination when the variability of the measured light is above the first threshold.

26. The method of claim 25, further comprising:

comparing the variability of the measured light to a second threshold where the second threshold is higher than the first threshold;

detecting incandescent illumination when the variability of the measured light is below the second threshold and above the first threshold;

detecting fluorescent illumination when the variability of the measured light is above the second threshold.